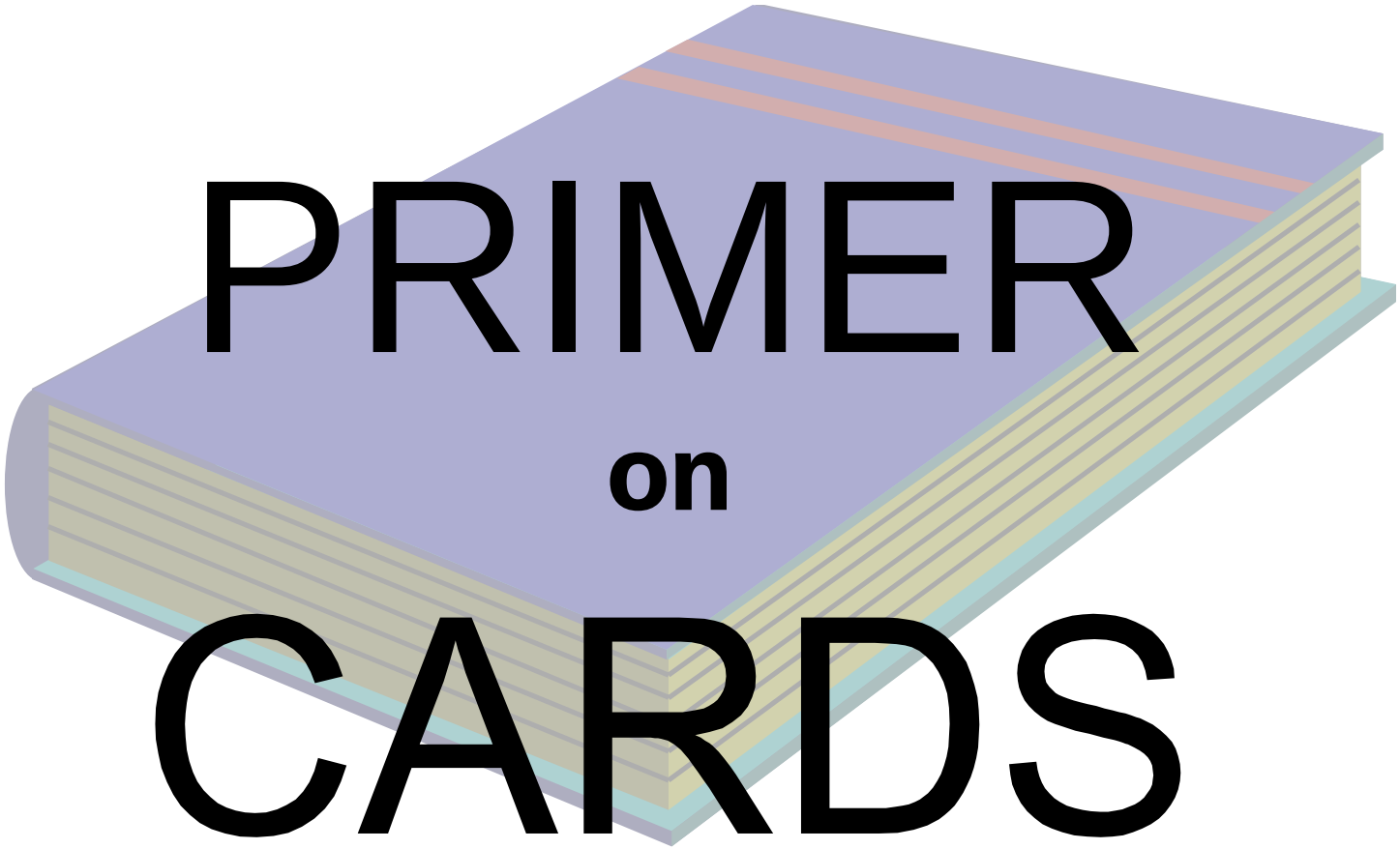


PRIMER on CARDS

Outline

- What is it?
- Why do we do it?
- Timeline
- Typical Contents
- Problem Areas
- Policies and Practical Guidelines

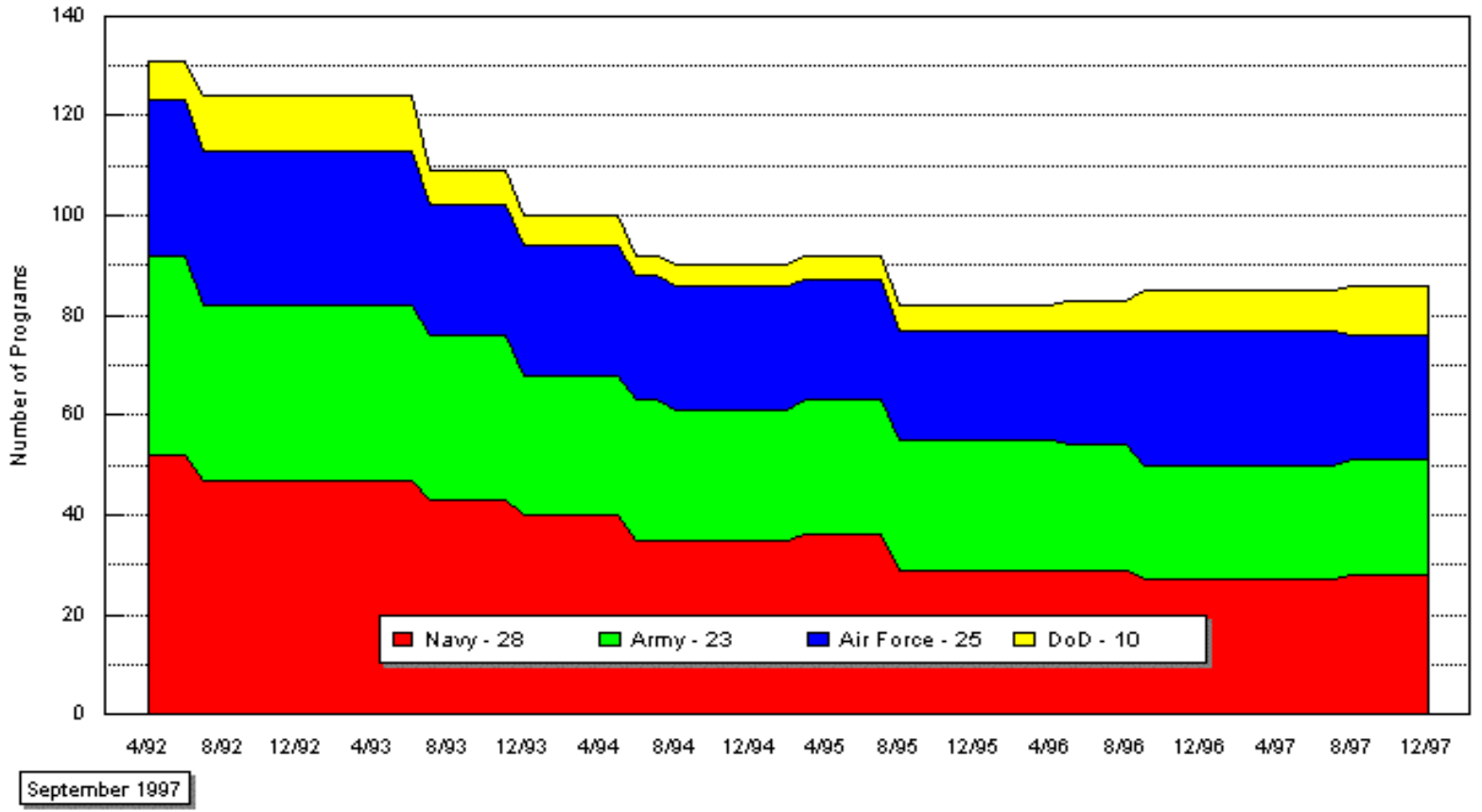
Definitions

- MDAPs = Major Defense Acquisition Programs
  - — Thresholds (FY96 $)

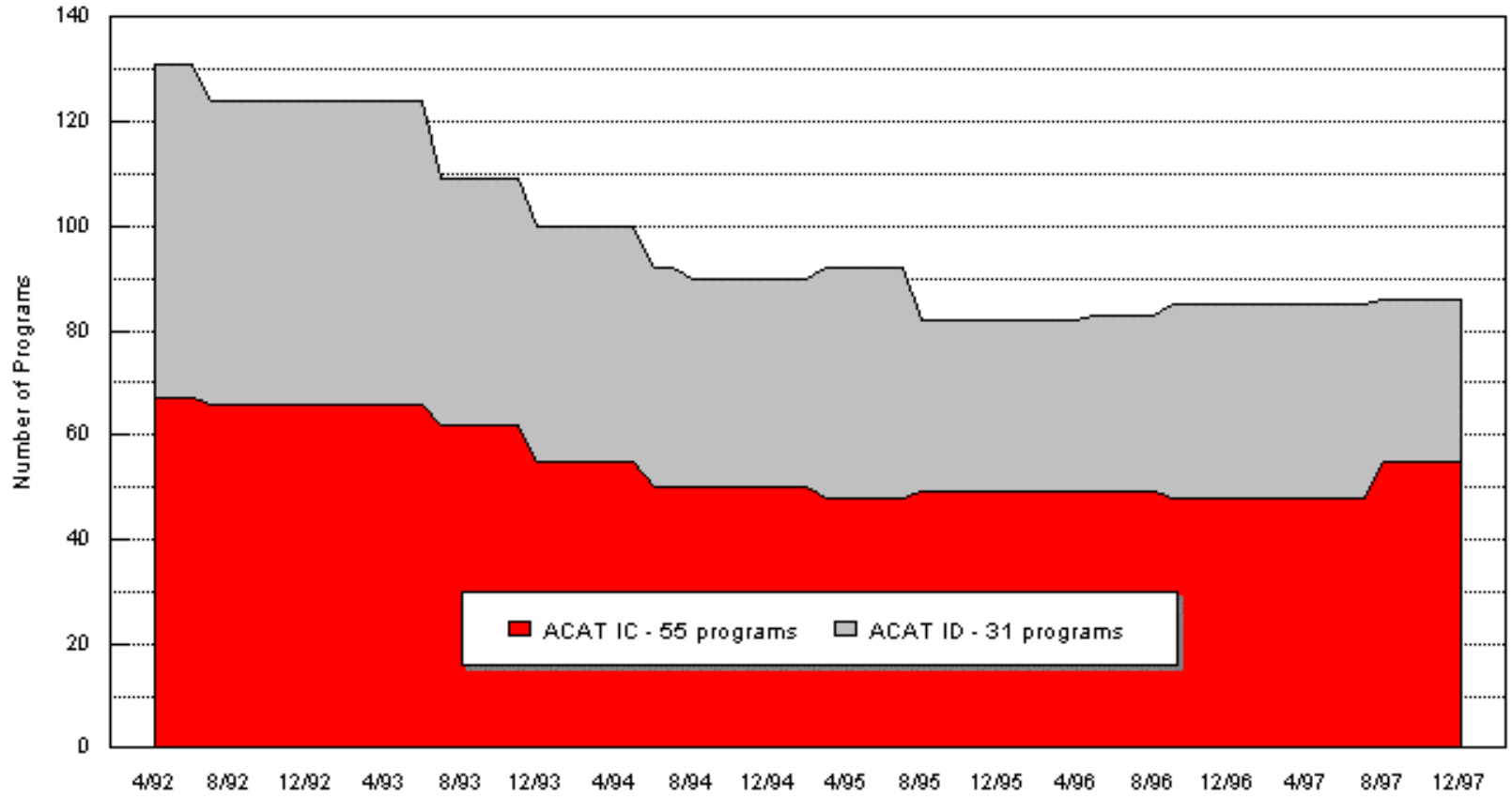
    ≥ $355M RDT&E, or

    ≥ $2.1B Procurement, or
  - — Designated by the Secretary of Defense

MDAPs BY SERVICE

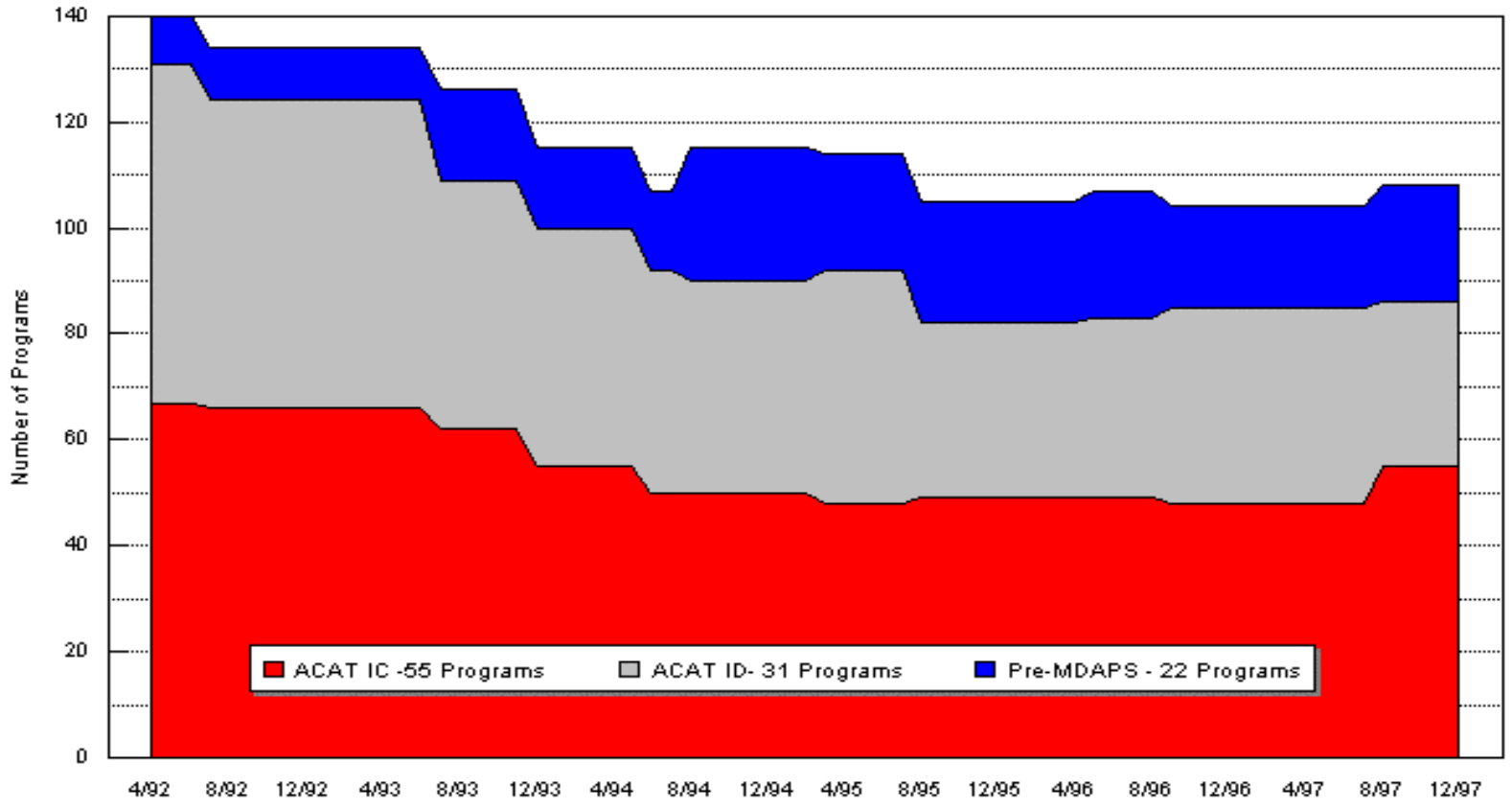


MDAPs BY CATEGORY



September 1997

MDAPs and Pre-MDAPs by Category



September 1997

CAIG's Mission

DoD 5000.2-R & DoDD 5000.4

Support the Defense Acquisition Board

- **Provide an independent cost estimate and a report on life-cycle costs for all Milestones beyond Milestone 0**
- Review and evaluate program office estimates and any others prepared by the sponsoring service
- Identify estimating deficiencies
- Include quantitative assessment of risk
- Identify cost implications of significant DAB issues

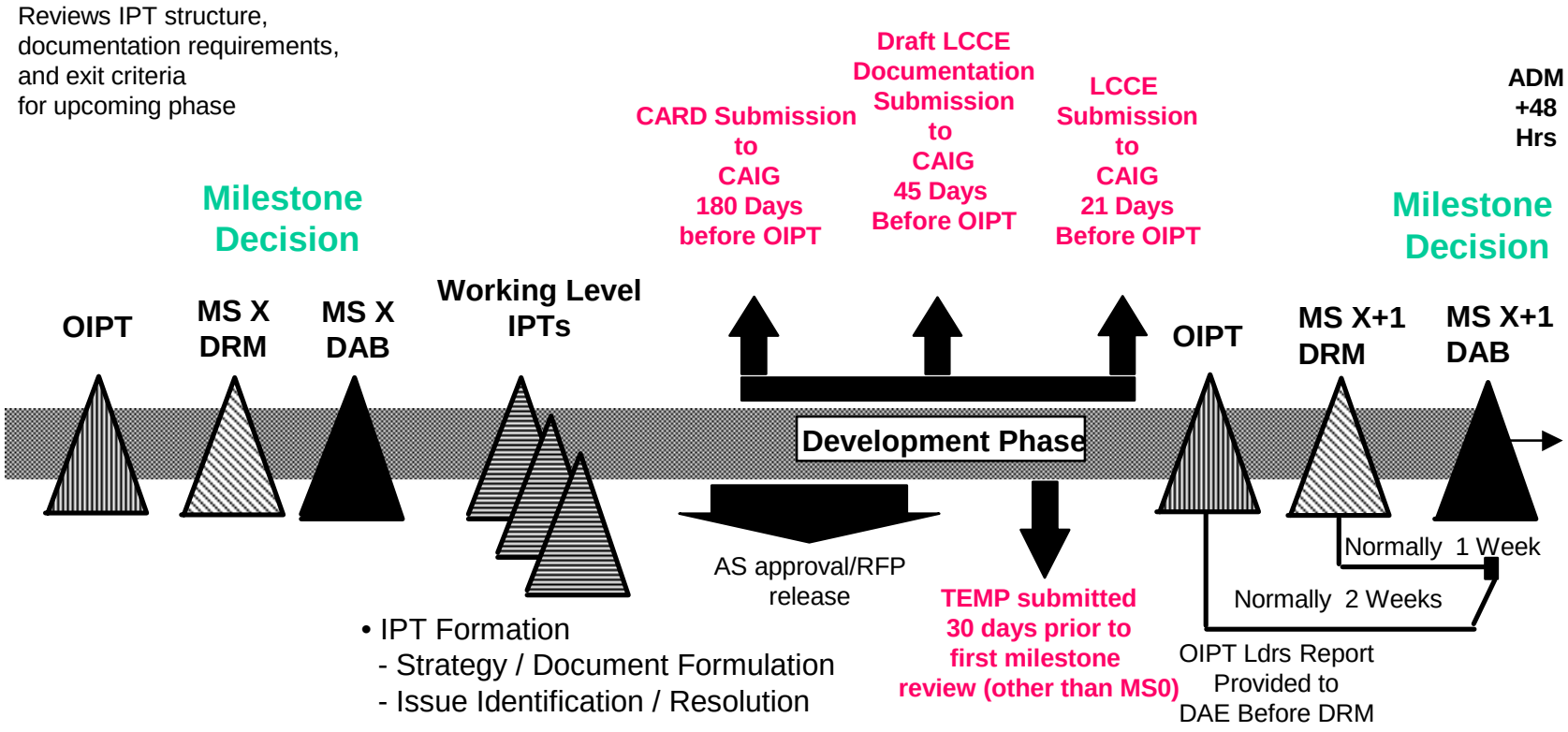
Scope of all Life-Cycle Estimates

- Full life-cycle costs
  - RDT&E
  - Hardware and Software
  - Supporting Data, Equipment, Training
  - Initial Spares
  - MILCON
  - Modifications
  - Operations and Support over System Life (Including Manpower)
  - Environmental compliance, demilitarization, clean-up, disposal
- Regardless of funding source
- Based upon program described in the CARD

What Is A CARD?

- Cost Analysis Requirements Description (CARD)
- Quantitative and narrative description of the technical, physical, and performance features pertinent to costing the system being acquired and of the acquisition program
- Describes all efforts associated with program regardless of funding source
- Not intended to be a four foot stack of paper

Key Events Leading to a Milestone Decision



Why Does It Take 180 Days?

- **Understand the System**
  - Resolve system ambiguities
  - Visit program offices, test centers, and system contractors
- **Find Models and Data**
  - Gather and analyze cost data on analogous systems and on the technology underlying the system
  - Refine existing models or most likely create new model(s)
- **Develop the Estimate**
  - Estimate the cost for each element of the system - possibly hundreds of elements - RDT&E, procurement, and operating and support costs
  - Develop cross-checks and resolve differences with other estimates
- **Document the Estimate**

ONGOING & PROJECTED CAIG ANALYSES

4/11/1996

Type	Program	1996 Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1997 Jan	Feb	Analyst
MS II	SB TBMD-Block IVA N&BMDO/S&TOIPT				20	15	6	27						Anderson/Kolesar
MS III	JSTARS AF/S&TOIPT				25	19	12	29						Jarvis
MS II	SBIRS AF/SOIPT				15	30	15	30						Zimmermann
MS II	H-1 Upgrade N/S&TOIPT			15		15	10	1	15					Catto
MS II	THAAD BMDO/S&TOIPT			1		1		25	15	1				
MS I	ABL AF/S&TOIPT				23			15	10	1				Woodson
MS I	JAST DoD/S&TOIPT			15			15	5	1	15				Pennett
MS II	B-1B DSUP AF/S&TOIPT						15	10	1	15				Miller

△ Kick-off ▽ Draft Doc ◇ CAIG ○ Overarching IPT □ DAB

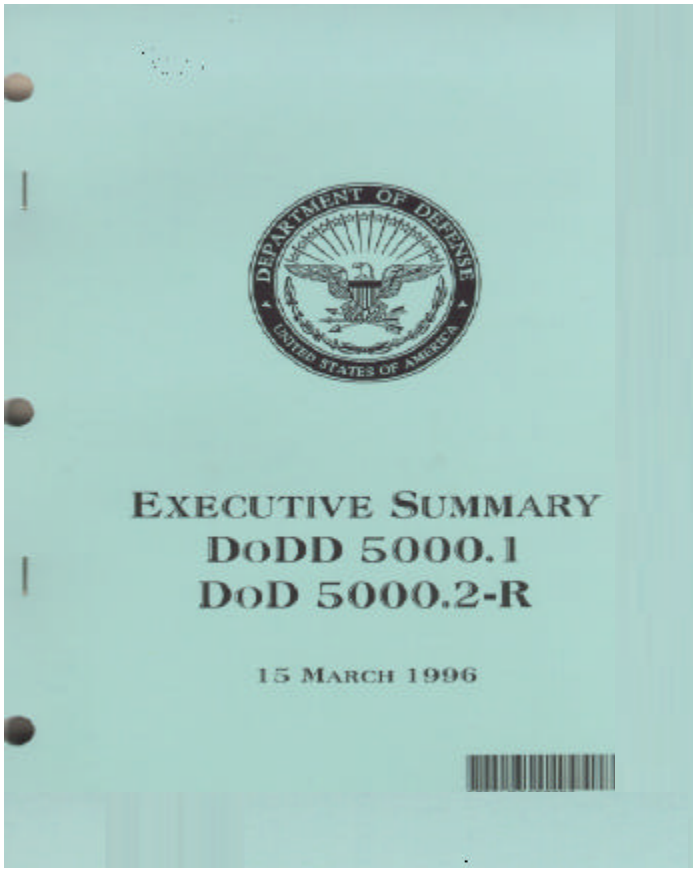
Why Do We Develop a CARD?

- Ensure estimates developed by program office, service cost agencies/centers, and the CAIG are based on common definition of program
- Prior to CARD, decision meetings were often delayed due to late breaking costing issues that turned out to be issues of program content
- With advent of IPTs and early CARD development, end game cost issues are substantive and worthy of DAB discussion
- In 1996, the USD(A&T) strongly supported CARD concept and its due date in the rewrite of DoD 5000.2-R

DoD 5000.2-R Direction

Section 3.5

- Component shall develop a CARD
- CARD is due at 180 days before OIPT, unless another due date is agreed to by the OIPT
- CARD shall be flexible, tailored, and make reference to information available in other documents
- For joint programs, CARD shall include the common program as agreed to by all participants as well as unique requirements



Who Should Prepare the CARD?

- In theory, system engineers within the program office with some assistance from cost estimators
- In practice, cost estimators with some help from system engineers. Modified on basis of questions from the cost centers/CAIG
- PEO should approve as CARD represents Component's official description

Level of Detail

Will vary depending on program maturity

- Milestone I estimates will typically be made using fairly high level parametric relationships
- Milestone II estimates normally use parametric models at the major subsystem level
- Milestone III estimates normally rely on actual cost data collected on items built during the development phase and tend to be made at a fine level of detail
- If detailed information is not available, draft CARD should provide ranges for parameters
  - Common at MS I
  - Less so at MS II
  - Extraordinary at MS III

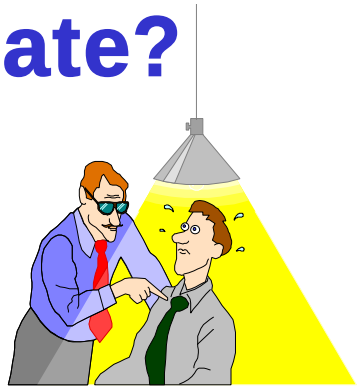
Level of Detail (continued)

- If decisions have yet to be made, draft CARD should attempt to bound the possibilities or a specific assumption should be given
  - TBDs are unacceptable
- Items should be identified as being
  - New developments
  - Refurbishments
  - Commercial-off-the-shelf or
  - Non-developmental
- Where applicable, name vendors, provide catalogue numbers and prices

Number of CARDs

- For MS I programs, it is becoming common for estimates to be developed for each alternative rather than rely on single generic estimate. Need a CARD for each alternative.
- If numerous alternatives, choose two-or-three that are mostly likely to be selected.
- If there are no favorites, choose two-or-three that establish a range of costs/risks for high, low, or moderate.
- If several alternatives can be explained in one CARD, then only one CARD is needed.

What happens if the CARD is late?



- CARD is due 180 days prior to OIPT
- More important for CARD to be submitted on time, even if it is only 80% complete, than it is to be submitted late but be 100% complete
- If late, the PM can expect a call
- If condition continues, PEO/SAEs will get involved
- If no improvement, CAIG will inform OIPT chair that it can not support scheduled meeting

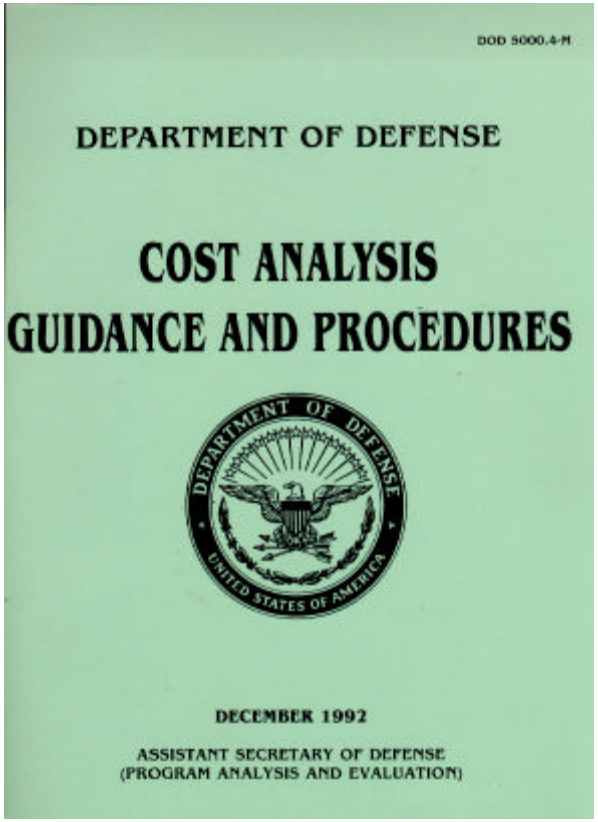
What happens when CARD arrives?

- CAIG policy calls for a CARD review within five working days and for a draft CAIG Chair memorandum that either accepts, conditionally accepts, or rejects the CARD.
- CAIG memo is expected to spell out problem areas.
- Unacceptable CARDs are rare, but they signify the program is in trouble.

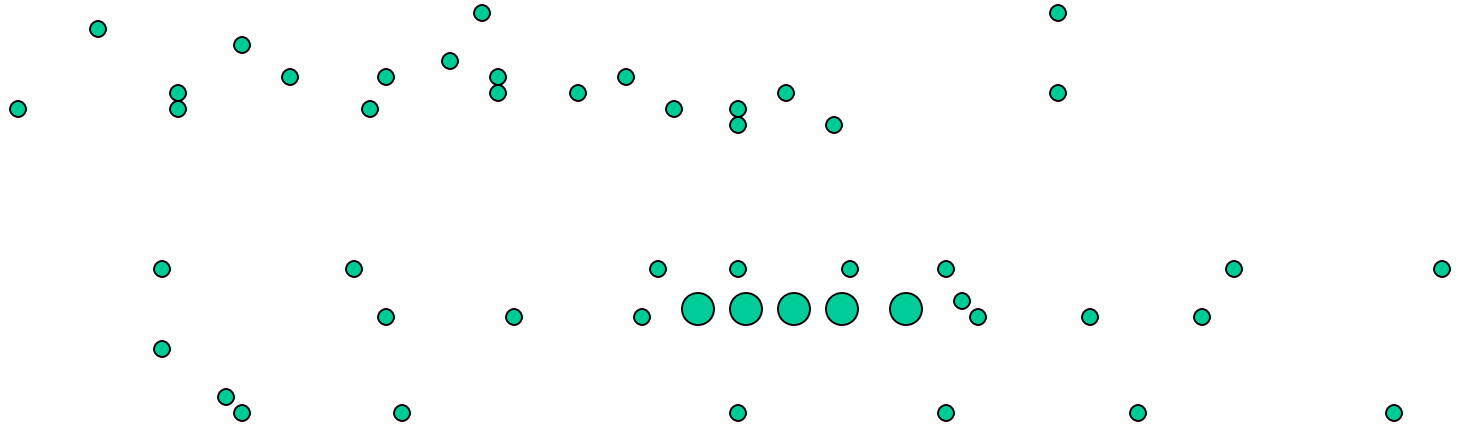
Contents of a CARD

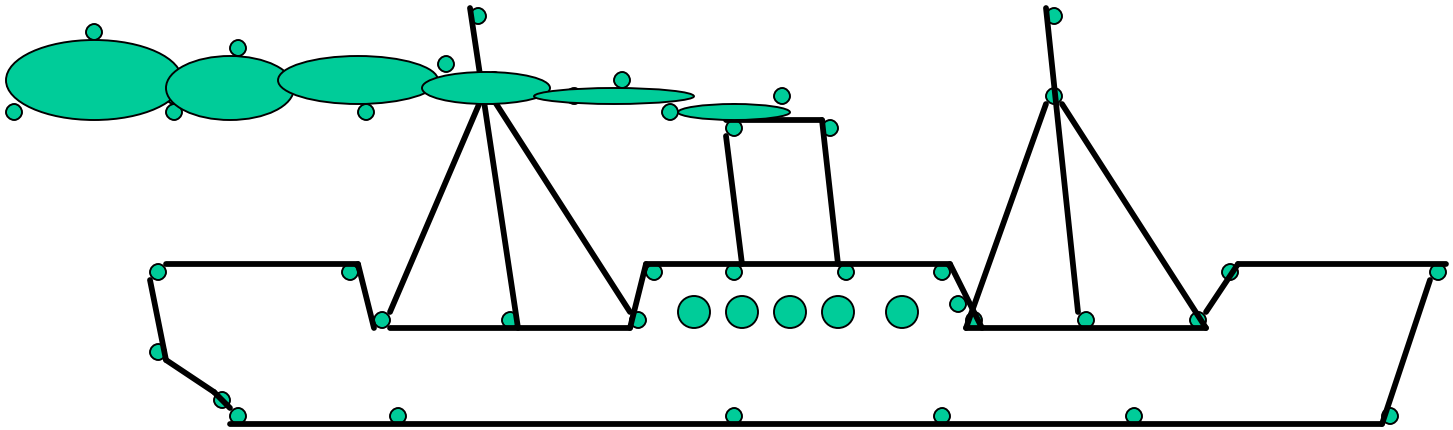
- System Overview
- Risk
- Operational Concept
- Quantity Requirements
- Manpower Requirements
- Activity Rates
- Milestone Schedule
- Acquisition Strategy/Plan
- Development Plan
- Facilities
- Track to Prior CARD
- Contractor Cost Data Reporting Plan

DoD 5000.4-M



Can You Connect the Dots and Find the System?



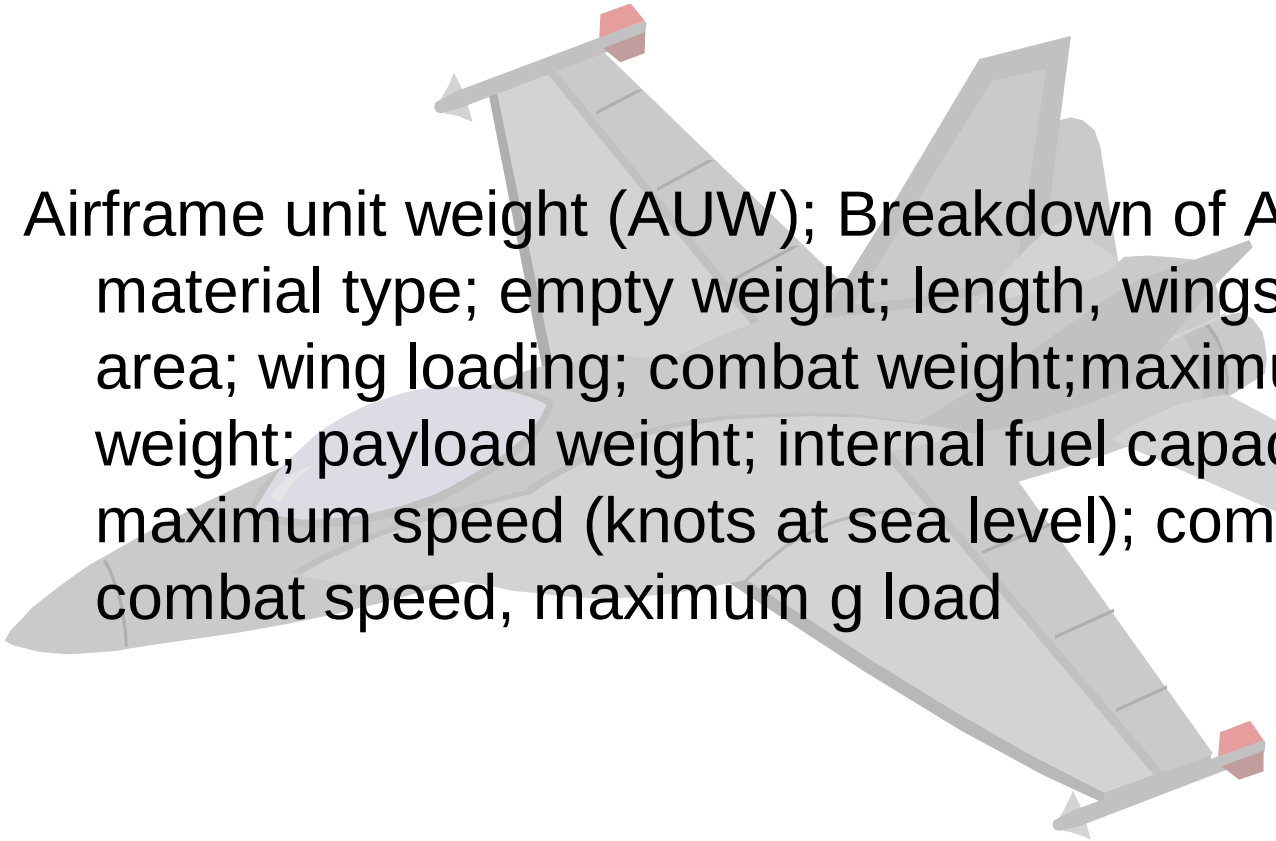


CARD Contents

System Overview

- **System Description** - mission, key performance parameters, relationship to other systems, picture or diagrams with major parts and subsystems identified.
- **Characteristics** - technical description of hardware and software, discussion should follow the elements in the WBS
- **Quality Factors** - operational availability, reliability, availability and maintainability requirements
- **Reference Systems** - describe currently operational system or/and systems with similar mission, discuss how this system is different.

Examples of Key System Characteristics for Aircraft



Airframe unit weight (AUW); Breakdown of AUW by material type; empty weight; length, wingspan; wing area; wing loading; combat weight;maximum gross weight; payload weight; internal fuel capacity; maximum speed (knots at sea level); combat ceiling; combat speed, maximum g load

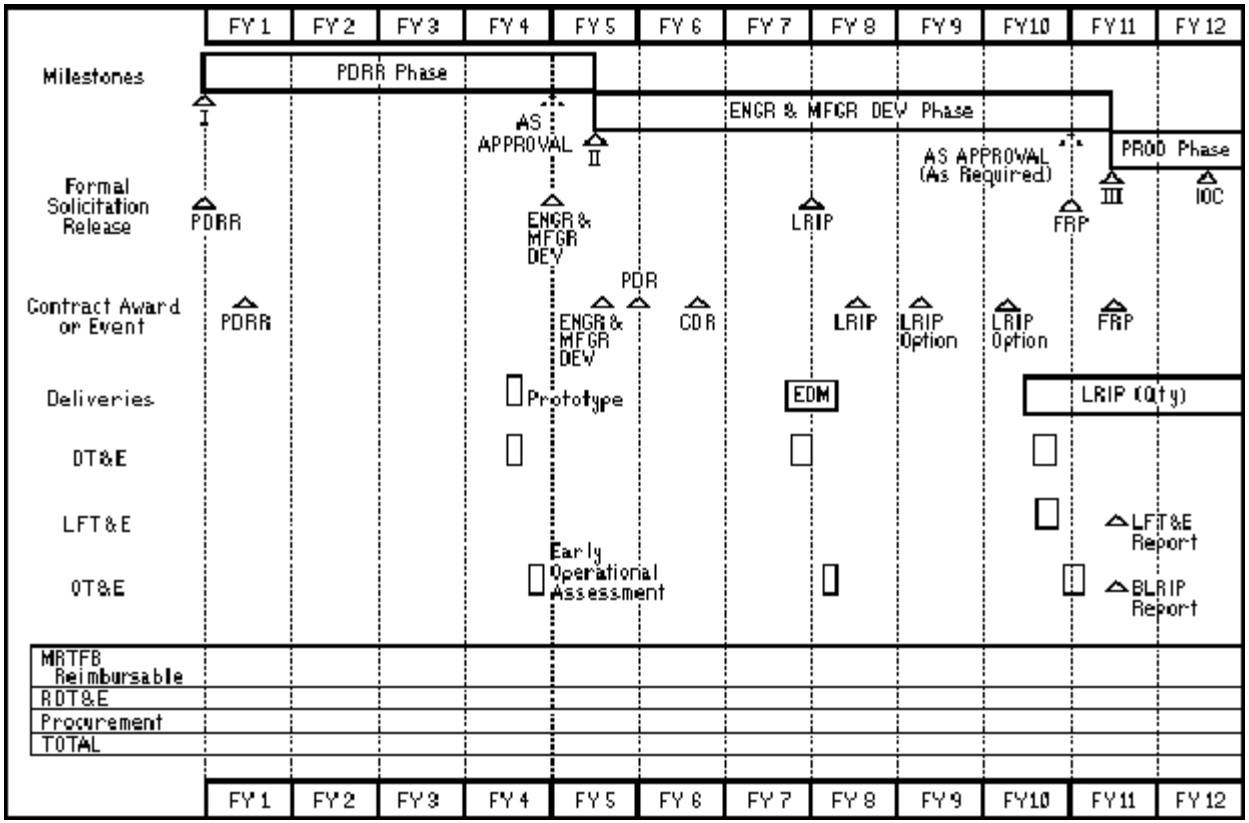
CARD Contents
Risk

- Where are we pushing the envelope? (Take two steps back from the program and then look at it.)
  - Design, technology maturity, test schedule, number of test assets, acquisition strategy, funding availability
- What other on-going or planned technology/ production programs have a potential impact on the proposed program?
- Identify risks for each acquisition phase.

CARD Contents (continued)

- Operational Concepts - force structure, basing plan, support & supply concepts, and training
- Quantity - numbers to be developed, tested, produced, and deployed by year
- Activity Rates - steaming hours/month, flight hours/month, shifts/day
- Milestone Schedule - standard GANTT chart with major events such as design reviews, OIPT and DAB reviews, major tests, etc.

Typical Schedule Layout



CARD Contents (continued)

- Acquisition Strategy - contractors and contract types
- Development & Testing - summarize development phases, describe DT&E (what assets, what tests, who does testing, and where accomplished), describe OT&E
- Facilities Requirements
- Track to Prior CARD
- Contractor Cost Data Reporting Plan (CCDR)

Contractor Cost Data Reporting (CCDR)

- CCDRs are DoD's primary means of collecting data on the costs that DoD contractors incur in performing DoD programs.
- Coverage begins at start of EMD and continues through the completion of production.
- CCDRs are required on all advanced development prototype programs.
- Reporting is required on firm fixed price contracts except for those that are competitively awarded and for which competitive conditions continue to exist.

Recent Examples

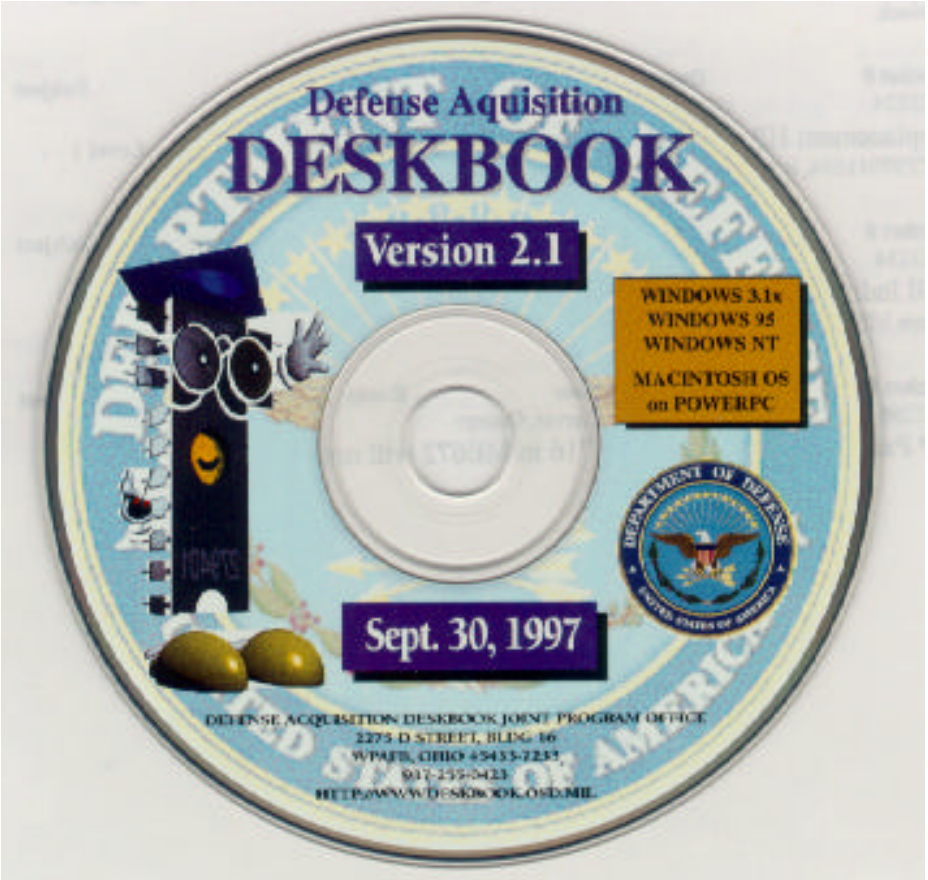
- **ABL** - PO drafted two CARDs, one for each unique contractor proposal
- **EELV** - PO paid each hardware contractor to prepare a CARD describing their design
- **GBS** - Late start - PO had team of system engineers document a point design - cost teams reviewed technical proposals for differences with point design
- **SBIRS-Low** -- CARD developed by a third-party systems integration contractor

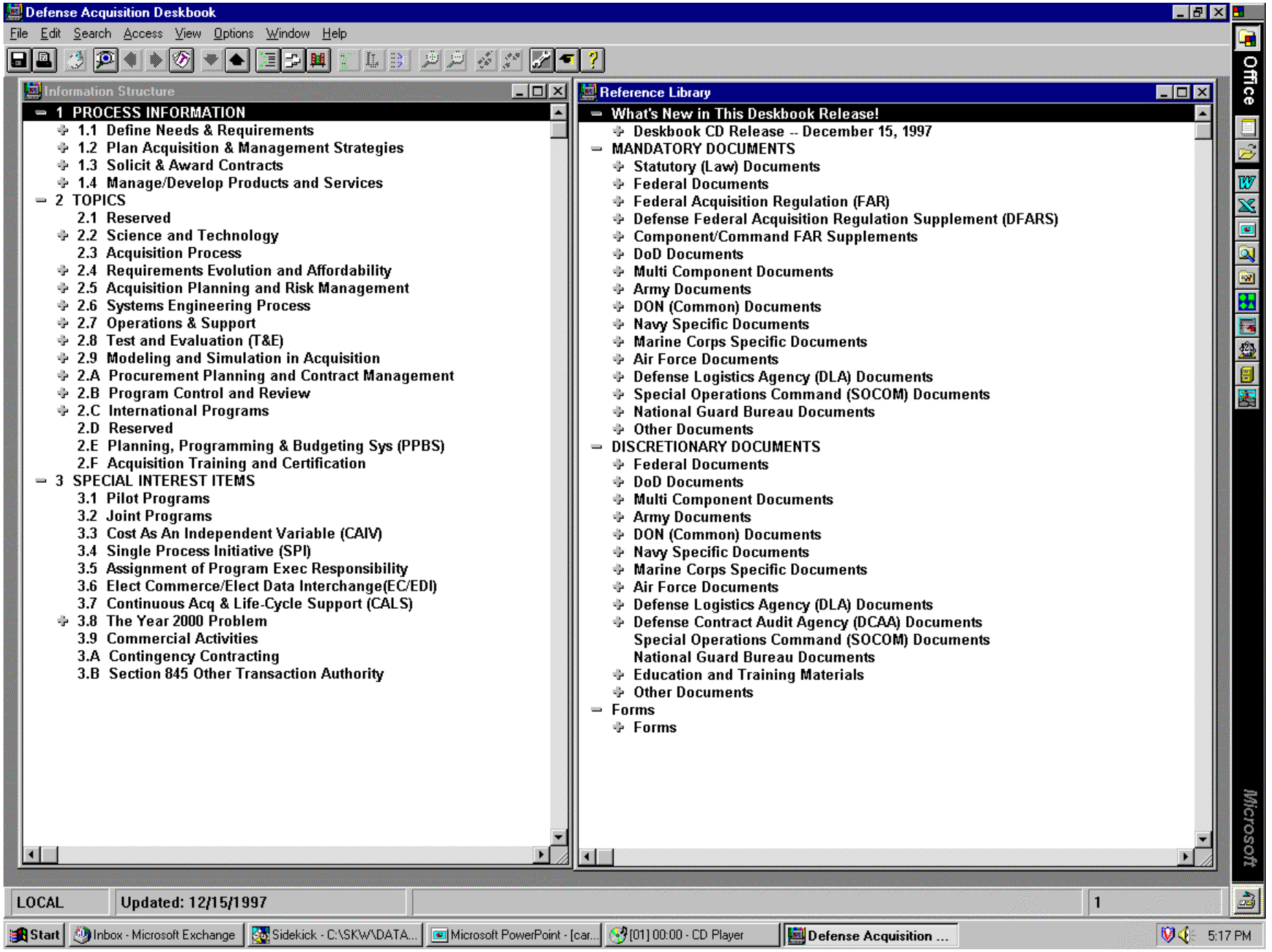
Life-Cycle Cost Estimating Policy and Practical Guidelines

- **DoD 5000.2-R**
  - 3.5.1. Life-Cycle Cost Estimates - CARD Requirement
  - 5.6. CAIG Procedures
  - 6.4.1. Contractor Cost Data Reporting
- **DoDD 5000.4 CAIG Directive**
- **DoD 5000.4-M Cost Analysis Guidance and Procedures**
- **Operating & Support Cost Estimating Guide, OSD/CAIG**
- **Defense Acquisition Deskbook**
  - Section 2.B.4. Cost Estimating
  - Section 2.B.7. Contractor Cost Data Reporting

Defense Acquisition Deskbook

HTTP://WWW.DESKBOOK.OSD.MIL




Defense Acquisition Deskbook
File Edit Search Access View Options Window Help
Information Structure
1 PROCESS INFORMATION
1.1 Define Needs & Requirements
1.2 Plan Acquisition & Management Strategies
1.3 Solicit & Award Contracts
1.4 Manage/Develop Products and Services
2 TOPICS
2.1 Reserved
2.2 Science and Technology
2.3 Acquisition Process
2.4 Requirements Evolution and Affordability
2.5 Acquisition Planning and Risk Management
2.6 Systems Engineering Process
2.7 Operations & Support
2.8 Test and Evaluation (T&E)
2.9 Modeling and Simulation in Acquisition
2.A Procurement Planning and Contract Management
2.B Program Control and Review
2.C International Programs
2.D Reserved
2.E Planning, Programming & Budgeting Sys (PPBS)
2.F Acquisition Training and Certification
3 SPECIAL INTEREST ITEMS
3.1 Pilot Programs
3.2 Joint Programs
3.3 Cost As An Independent Variable (CAIV)
3.4 Single Process Initiative (SPI)
3.5 Assignment of Program Exec Responsibility
3.6 Elect Commerce/Elect Data Interchange(EC/EDI)
3.7 Continuous Acq & Life-Cycle Support (CALS)
3.8 The Year 2000 Problem
3.9 Commercial Activities
3.A Contingency Contracting
3.B Section 845 Other Transaction Authority
Reference Library
What's New in This Deskbook Release!
Deskbook CD Release -- December 15, 1997
MANDATORY DOCUMENTS
Statutory (Law) Documents
Federal Documents
Federal Acquisition Regulation (FAR)
Defense Federal Acquisition Regulation Supplement (DFARS)
Component/Command FAR Supplements
DoD Documents
Multi Component Documents
Army Documents
DON (Common) Documents
Navy Specific Documents
Marine Corps Specific Documents
Air Force Documents
Defense Logistics Agency (DLA) Documents
Special Operations Command (SOCOM) Documents
National Guard Bureau Documents
Other Documents
DISCRETIONARY DOCUMENTS
Federal Documents
DoD Documents
Multi Component Documents
Army Documents
DON (Common) Documents
Navy Specific Documents
Marine Corps Specific Documents
Air Force Documents
Defense Logistics Agency (DLA) Documents
Defense Contract Audit Agency (DCAA) Documents
Special Operations Command (SOCOM) Documents
National Guard Bureau Documents
Education and Training Materials
Other Documents
Forms
Forms
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Defense Acquisition ...
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Microsoft

2.B.4 Cost Estimating

General Information:

Description **Background** **Courses**

References:

Mandatory

Discretionary Practices:

DoD-Wide Practices:

Scope of Life-cycle Cost Estimates

Cost Analysis Requirements Description (CARD)

……

……

Command-Wide Practices:

Sample Formats & Examples:

DoD-Wide Sample Format:

AIM-9X CARD Example

Defense Acquisition Deskbook
Section 2.B.4

DoD-Wide Discretionary Practices

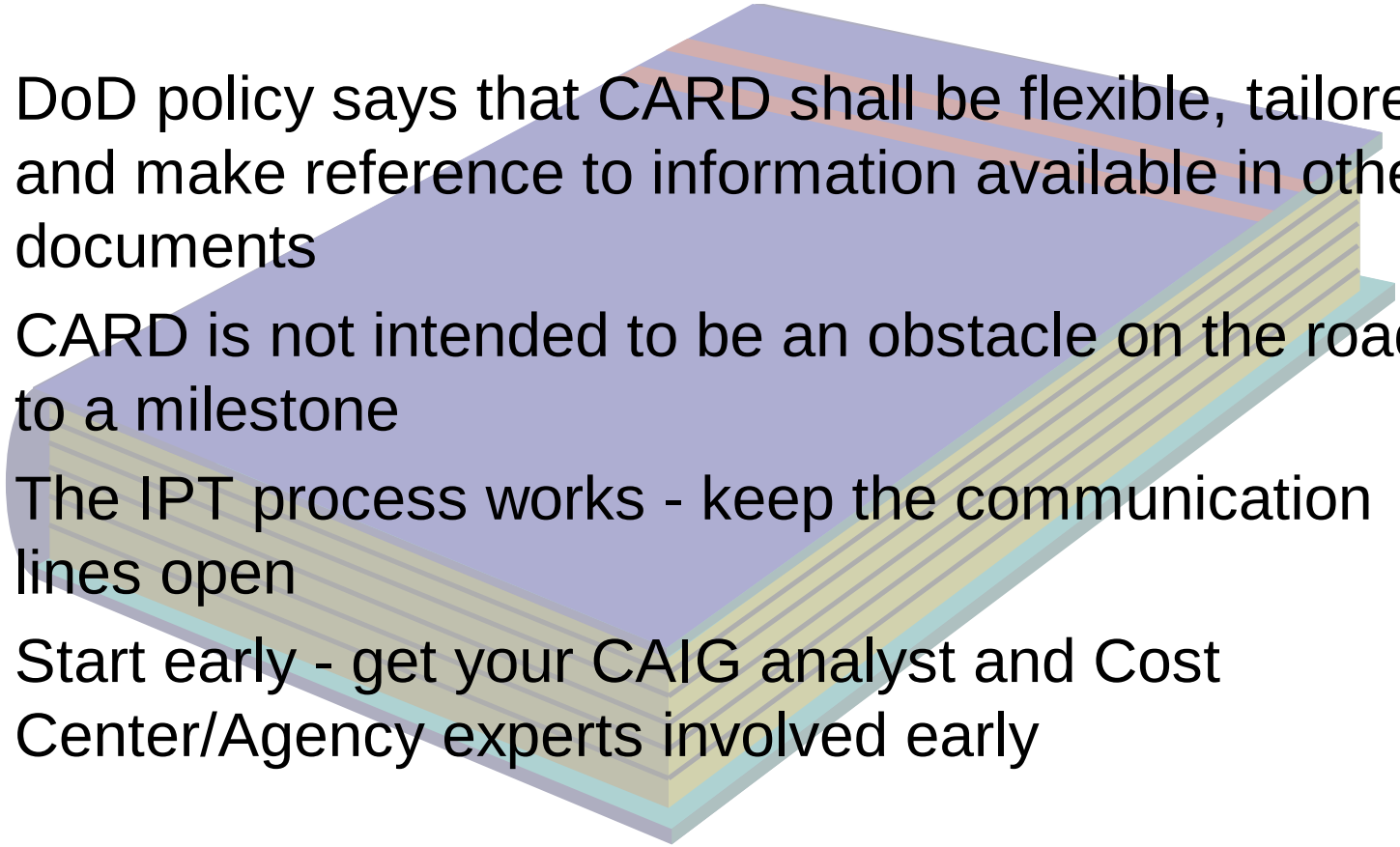
- Scope of LCC Estimates
- CARD Guidelines
- Cost Estimate Documentation Guidelines
- Implementation of ICE statute
- The Component Cost Analysis estimate
- Background on the CAIG and ICE

Defense Acquisition Deskbook
Section 2.B.7

DoD-Wide Discretionary Practices

- Principal components of the CCDR system
- Developing a CCDR plan
- Schedule for submitting CCDR plans and reports
- Sources and interpretation of CCDR data

Parting Message



- DoD policy says that CARD shall be flexible, tailored, and make reference to information available in other documents
- CARD is not intended to be an obstacle on the road to a milestone
- The IPT process works - keep the communication lines open
- Start early - get your CAIG analyst and Cost Center/Agency experts involved early